INSTRUMENT AND MEASUREMENT TECHNICIAN SERIES

Code No.	Class Title	Occ. Area	Work Area	Prob. Period	Effective Date
3983	Instrument and Measurement Technician I	02	501	6 mo.	11/01/80
3984	Instrument and Measurement Technician II	02	501	6 mo.	11/01/80
3985	Instrument and Measurement Technician III	02	501	6 mo.	11/01/80

Promotional Line: 159

Series Narrative

Employees in positions allocated to this series work with measurement equipment that primarily involves mechanics, electronics, optics, radiant energy, and/or hydraulics. At one level of the Series or another, they operate, maintain, repair, test, construct, develop, and/or purchase measurement equipment. They often serve as resource personnel on measurement equipment and methods for researchers who have a limited knowledge of the measurement field and may conduct tests for them. They may also supervise other Instrument and Measurement Technicians and/or other employees.

DESCRIPTION OF LEVELS OF WORK

Level I: Instrument and Measurement Technician I 3983

Working under direct supervision, employees in positions allocated to this level perform basic, entry level duties in the calibration, construction, repair, and maintenance of measurement instruments and accessories. They may also conduct experimental tests of a routine nature for researchers.

An Instrument and Measurement Technician I typically--

1. performs one or a combination of the following duties

    a. checks and recalibrates simple instruments (such as pointer-type meters, dial indicators, normal frame-rate motion picture cameras, and linear deflection transducers), generally at a level of precision and accuracy typical of shop- or applications-grade (on the order of 1 part per 1000 or less)

    b. constructs basic measuring elements from specific, detailed instructions and/or drawings (such as wiring circuit boards with logic chips and transistors from schematics and layout drawings or modifying optical or television cameras by attaching special-purpose lenses)

    c. makes routine repairs to simple instruments and assists in major repair of more complex instruments

    d. performs acceptance tests on simple purchased equipment (such as simple voltmeters, pressure gauges, and cameras)

    e. may assist in test of instruments and/or instrumented experiments

f. installs transducer elements in experimental systems (such as bonded electrical strain gauges, thermocouples, thermisters, and acceleration gauges)

g. performs routine, elementary service and/or preventive maintenance on instruments (such as cleaning and adjusting transits, tape recorder heads and tape paths, low level voltage and current switches, and data logger printers)

h. provides students and staff members with general description of instruments or instrument systems (such as generic description of and the type number of transducers, signal conditioning, data storage, and display systems)

2. may maintain files of instruction books for commercially purchased equipment and manufacturer's equipment notes

3. performs related duties as assigned

Level II: Instrument and Measurement Technician II 3984

Working under general supervision, employees in positions at this level perform skilled duties in the construction, repair, adjustment, calibration, and maintenance of instruments and measuring devices. They may also conduct tests of relatively high precision and accuracy, requiring the use of laboratory-standard grade instruments, rapid input rates, multiple sensor inputs, or similar degrees of complexity, precision, and accuracy.

An Instrument and Measurement Technician II typically--

1. performs one or a combination of the following duties-

a. working from a general description of the measurement task required, assembles measuring systems (such as a variety of different transducers and signal conditioning feeding a common storage and/or display unit) from existing or obtainable sub-units; or, if necessary, designs and constructs special, non-commercial instruments of moderate complexity (such as special analog electronic units for arithmetic operations on measured or control signals)

b. performs repairs and instruments of moderate complexity (such as electro-hydraulic servo systems, ph meters, potentiometers, and high-speed motion picture cameras); directs repair of simple instruments; and assists in repair of complex instruments and/or systems

c. conducts acceptance tests for complex purchased equipment (such as data loggers, data acquisition and data processing miro- or mini-computers and peripheral transducers, or ultrasonic or acoustic emission and measuring devices); writes purchase requisitions for standard commercial instruments

d. in conjunction with research staff, directs data logging and testing sequence of experimental research programs

e. establishes calibration constants of uncalibrated system consisting of transducers, signal conditioning, and storage or display unit; verifies performance of systems (such as linearity, hysteresis, or reproducibility

f. when conducting tests for researchers, selects gauge location and mounting techniques and chooses most applicable gauge from available inventory or purchase allowance

g. performs preventive maintenance of moderately complex instruments and/or measurement systems (such as alignment of recording and reproduction electronics of analog or digital tape units or processor and memory tests of digital micro- and mini-computer data systems)

h. explains operating principles and limits of instruments or instrument system to students and staff members

2. performs related duties as assigned

Level III: Instrument and Measurement Technician III 3985

Working under direction from research or academic staff members, employees in positions allocated to this level perform duties of a high technical level in the construction, repair, adjustment, calibration, and maintenance of measuring devices and systems. They act as consultants to researchers on measurement equipment and techniques, and they may also supervise and train other Instrument and Measurement Technicians and/or other subordinate personnel.

An Instrument and Measurement Technician III typically--

1. performs one or a combination of the following duties

a. selects from existing or obtainable stock equipment to be used in multi-measurement systems being developed to solve researchers needs, based on considerations of the parameters of the system elements (such as frequency response, effect of the transducer on the variables being measured, or sensitivity of the system); or, if necessary, designs complex, non-commercial instruments systems (such as interfaces between analog measuring devices and digital micro-logic assemblies or interface between digital systems and analog control signals)

b. directs repair program for measurement instruments of all degrees of complexity; determines if commercial repair-service is needed; and assists in determining if equipment cannot or should not be repaired and should be disposed of

c. writes bid specifications for complex measurement systems (such as electro-hydraulic loading and measuring instruments; data acquisition, processing, and display computers; or x-ray diffraction and inspection systems); establishes level and degree of acceptance tests for purchased equipment; and acts as liaison with vendors of service organizations

d. supplies instrument assemblies and/or techniques for quick evaluation and/or processing of data during test sequences for research staff in those instances when succeeding experiments are determined by preceding results and/or when the measured result controls the experiment input

e. directs programs of calibrating instruments according to procedures and standards of the National Bureau of Standards

f. evaluates applicability of transducers or gauges to specific measurement environments

g. establishes and supervises preventative instrument/equipment maintenance programs

h. advises students and staff members on the applicability of available measurement systems for problems under investigation

2. may assign and review work of other Technicians and/or other employees; recommend employment, promotion, discipline, termination etc. of subordinates

3. performs related duties as assigned

MINIMUM ACCEPTABLE QUALIFICATIONS REQUIRED FOR ENTRY INTO

Level I: Instrument and Measurement Technician I 3983

CREDENTIALS TO BE VERIFIED BY PLACEMENT OFFICER

1. any one, or any combination, of the following types of preparation

   (a) credit for college course work in electronics, electrical power, physics, stress analysis, optics, mechanical engineering, chemical engineering, physical measurements associated with any of the physical sciences, differential calculus, integral calculus, and/or differential equations

   (b) experience in the repair and maintenance of optical, hydraulic, mechanical, electrical, and/or electronic instruments and/or computer equipment

   (c) industrial, military, and/or technical school training in a field related to instrument and measurement work

   that totals 1.0 unit according to the following conversion rates:

   24 semester hours of "a" = 1.0 unit

   24 months of "b" - 1.0 unit

   24 months of "c" = 1.0 unit.

   Amounts of the various types of experience and/or training less than those define above as being equivalent to 1.0 unit should be converted to decimal equivalents and added together when computing combinations of the different types of preparation listed above.

Level II: Instrument and Measurement Technician II 3984

CREDENTIALS TO BE VERIFIED BY PLACEMENT OFFICER

1. possession of qualifications required for the first level of this series

2. any one, or any combination, of the following types of additional preparation

   (a) credit for college course work in fields listed in "a" of level I above

   (b) experience comparable to that gained at the first level of this series

   that totals 1.0 unit according to the following conversion rates:

   24 semester hours of' "a" = 1.0 unit

   24 months of' "b" = 1.0 unit.

   Amounts of the various types of experience and/or training less than those define above as being equivalent to 1.0 unit should be converted to decimal equivalents and added together when computing combinations of the different types of preparation listed above.

Level III: Instrument and Measurement Technician III 3985

CREDENTIALS TO BE VERIFIED BY PLACEMENT OFFICER

1. possession of qualifications required for the second level of this series

2. two additional years of experience comparable to that gained at the second level of this series

PERSONAL ATTRIBUTES NEEDED TO UNDERTAKE JOB

none